System and Method for Incrementally Executing A Client/Server Application

Cross-Reference to Related Application

5   This application claims the benefit of U.S. Provisional Patent Application Serial No. 60/261,994 filed January 16, 2001.

Field of the Invention

10   The present invention relates generally to a method of running a computer application, and more particularly to a system and method for incrementally executing a client/server application.

Background of the Invention

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In a local computing environment, such as a personal computer containing a hard disk drive and internal cache, the time required for the loading and execution of a computer application is generally not an issue. In this environment there are sufficient resources connected by high bit rate
20   pathways for program loading and executing within a period of time acceptable to most users.

However, this is not the case for client/server applications in which the bulk of the application is run remotely on a server. Even in a communications
25   system in which a client computer is connected and in communication with a server computer over high bit rate communication links, network bit rates typically do not compare with those found between components of a local system.

30   Attempts using distinct "quick-viewing" programs running separately from the main application have been made to reduce execution times for client/server applications running in the Windows environment. For Web-based environments, characteristically more sensitive to loading and execution delays, browser applets have been employed, involving a heavily
35   coded client requiring a virtual machine separate from the browser.

The problem with these methods is that they use separate components that are large and resource intensive relative to the limited return of functionality they provide. What is needed is a method of providing a reduction in execution times for client/server applications without the requirement for separate, resource intensive components.

For the foregoing reasons, there is a need for an improved method of executing a client/server application.

Summary of the Invention

The present invention is directed to a system and method for incrementally executing a client/server application. Both the system and method leverage existing communications network infrastructure having at least one client computer and at least one server computer, wherein the at least one client computer and the at least one server computer are in communications with each other over one or more communications links within the network infrastructure.

The system includes a server component comprising a plurality of portions, and provided on the at least one server computer and a client component provided on the at least one client computer, the client component including one or more command selectors. Each of the one or more command selectors has associated code for selecting a function available from the plurality of portions of the server component. Further, each of the one or more command selectors has an associated parameter for use by the server component in determining the appropriate portion of the plurality of portions to execute to provide the selected function.

The method includes the steps of providing a server component comprising a plurality of portions on the at least one server computer, providing a client component on the at least one client computer, and executing an appropriate portion from the plurality of portions of the server

component applicable to and upon an initial request from the client component for an application function. The method further includes the steps of executing an applicable additional portion of the plurality of portions of the server component for each request received from the client component for an application function not available from any running portion or portions of the server component, and running all executed portions until an end session command is received.

In an aspect of the invention, one portion of the plurality of portions is a compact portion initially executed upon receipt of a first application function request from the client component, the compact portion delivering a streamlined subset of functions applicable to commands most commonly requested to provide a fast executing initial portion of the application. Should the function requested lie outside of the function set of the compact portion, an applicable additional portion is loaded and executed, combining its functions with the first portion's functions, with minimal overlap, to provide enhanced functionality. Both portions, and any additional portions, will continue to run for the remainder of the session.

The invention provides improved response times for access to client/server applications, and in particular to Web-based client/server applications, which are characteristically more sensitive to loading and execution delays.

Other aspects and features of the present invention will become apparent to those ordinarily skilled in the art upon review of the following description of specific embodiments of the invention in conjunction with the accompanying figures.

Brief Description of the Drawings

These and other features, aspects, and advantages of the present
invention will become better understood with regard to the following
description, appended claims, and accompanying drawings where:

Figure 1 is an overview of a system for incrementally executing a
client/server application according to an embodiment of the present
invention;

Figure 2 is an overview of a method for incrementally executing a
client/server application according to an embodiment of the present
invention;

Figure 3 illustrates an embodiment of the present invention wherein a
portion of the plurality of portions is an initially executed compact
portion;

Figure 4 illustrates a Web-based embodiment of the present invention;

Figure 5 is a flow chart illustrating the operation of a Web-based
client/server application according to an embodiment of the present
invention.

Detailed Description of the Presently Preferred Embodiment

The present invention is directed to a system and method for
incrementally executing a client/server application. Both the system and
method leverage existing communications network infrastructure 11 having at
least one client computer 10 and at least one server computer 12, wherein the
at least one client computer 10 and the at least one server computer 12 are in
communications with each other over one or more communications links 14
within the network infrastructure 11.

As illustrated in Figure 1, the system includes a server component 16
comprising a plurality of portions 20, and provided on the at least one server
computer 12 and a client component 18 provided on the at least one client

computer 10, the client component 18 including one or more command selectors 22. Each of the one or more command selectors 22 has associated code 24 for selecting a function available from the plurality of portions 20 of the server component 16. Further, each of the one or more command
5   selectors 22 has an associated parameter 26 for use by the server component 16 in determining the appropriate portion of the plurality of portions 20 to execute to provide the selected function.

As illustrated in Figure 2, the method includes the steps of providing a
10   server component comprising a plurality of portions on the at least one server computer 100, providing a client component on the at least one client computer 102, and executing an appropriate portion from the plurality of portions of the server component applicable to and upon an initial request from the client component for an application function 104. The method further
15   includes the steps of executing an applicable additional portion of the plurality of portions of the server component for each request received from the client component for an application function not available from any running portion or portions of the server component 106, and running all executed portions until an end session command is received 108.
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The network infrastructure 11 can be any appropriate network that includes both a client computer and a server computer connected to and in communications with each other over one or more communication links appropriate for the network, as would be known to one skilled in the art.
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As illustrated in Figure 3, in an embodiment of the present invention, one portion of the plurality of portions 20 is a compact portion 28 initially executed upon receipt of a first application function request from the client component 18. Execution of the application occurs in stages, with a compact
30   portion 28 of the application being initially invoked to provide a streamlined subset of functions applicable to commands most commonly requested to provide a fast executing initial portion of the application. Should the function requested lie outside of the function set of the compact portion 28, an applicable additional portion 29 is loaded and executed, combining its

functions with the compact portion's 28 functions, with minimal overlap, to provide enhanced functionality.

As an example, the compact portion 28 of the application can be limited to providing document viewing functions to the client computer 10. The compact portion 28 will continue to run alone until such time as the user selects a function not available from the streamlined subset of functions of the compact portion 28. All executed portions will continue to run for the remainder of the session.

In an embodiment of the present invention, the system and method are Web-based, whereby HTML and scripting or another similar language are employed, allowing for a thinner client when compared to a browser applet. As illustrated in Figure 4, in this embodiment the client computer 10 includes a browser 30 suitable for retrieving and displaying a Web page 32 through which the client computer 10 requests functions from the server computer 16. The Web page 32 includes one or more links 34 each having an associated Universal Resource Locator (URL) 36 that points to a document 38 hosted by the server computer 12, whereby the URL 36 invokes an appropriate query.

The selection of a link 34 forwards script 24 and an appended parameter 26 to the server component 16, which reads the value of the appended parameter 26 associated with the link 34 to determine the appropriate portion of the server component 16 to invoke to provide that function. When a user selects a link 34 on the client computer 10 associated with a function not provided by a running portion or portions of the server component 16, the applicable portion is determined, loaded and executed, with the script 24 directing which command to execute.

The application runs script with limited "crossover". As additional portions are executed, the only thing noticeable to the user is a slight delay as the original view page is replaced with a new page. As well, the invention enables a large decrease in the number of lines of script at initial runtime when compared with a full version of an application, enabling preview pages

to be viewed very quickly. Where appropriate, an application can be further divided into additional portions for execution for improved efficiency as would be known to one skilled in the art.

5   By initially executing a compact version of the application, the invention provides improved response times for access to client/server applications, and in particular to Web-based client/server applications, which are characteristically more sensitive to loading and execution delays.

10   Although the present invention has been described in considerable detail with reference to certain preferred embodiments thereof, other versions are possible. Therefore, the spirit and scope of the appended claims should not be limited to the description of the preferred embodiments contained herein.